DON'T SAY IT --- *Write It!*

DATE: March 27, 1995

TO: Debbie Isom H6-08

FROM: Jennifer F. Young H4-83

Telephone: (509) 376-7044

cc: Sean Driggers H6-01

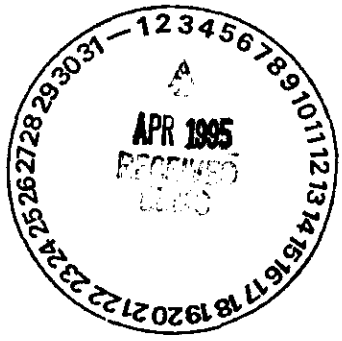
SUBJECT: DOCUMENT SUBMITTAL TO OPERABLE UNIT 200-ZP-2

Please submit the following documents to the Administrative Record under the 200-ZP-2 Operable Unit:

- 200 NPL Agreement/Change Control Form; Control # BHI-00188
- Waste Control Plan: Technology Demonstration of Purus Unit-200-ZP-2 OU

Please let me know if you have any questions.

Thank you!



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WASTE CONTROL PLAN

Work Scope Description: Technology Demonstration of Purus Unit - 200-ZP-2 Operable Unit (See Attachment 1 for specific wastes addressed by this Waste Control Plan)

List Constitutents of Concern: Chlorinated Hydrocarbons; primarily Carbon Tetrachloride (CCl_4); Chloroform and VOCs; Isopropanol will be used for decontamination.

Site Description: Z-9 Crib CCl_4 Vapor Extraction System Site, 200-ZP-2 Operable Unit, 200 West Area, Hanford Site, Richland, WA

Reference: BHI-00182 Rev: 0 Date Approved: 03/01/95

Preparer/ Project/RI Coordinator (Print/Sign Name)	Date	Safety Class	Impact Level
S.A. Driggers/			

Field Team Leader/ Cognizant Engineer: R.K. Tranbarger IDW Coordinator: G.G. Hopkins

Planned Drilling Start and Finish Dates: From March 6, 1995 To: Sept. 30, 1995

Waste Storage Facility ID Number(s): N/A

Field Screening Methods

Method	Frequency	Reference	Detection Range	Analyst
Photo-Acoustical IR Spec:	Variable	B&K Procedure	0-1000,000 ppm	
pH		EIP 4.1	0-14	

Laboratory Methods (constituents of concern)

Method	Frequency	Reference	Detection Limits	Contract Lab
Refer to attached sampling plan BHI-00182, Rev. 0, Appendix A				

APPROVALS (Print/Sign Name and Date)

S.A. Driggers 3/6/95 — Project/RI Coordinator

R.K. Tranbarger 3/6/95 — Field Team Leader/Cognizant Engineer

G.G. Hopkins for Pete Knight per telecon 3/6/95 — IDW Coordinator

C. St. John for C. St. John per telecon 3/4/95 — Safety Function (if required)

S.O. DeLeon 3/6/95 — Quality Assurance (if required)

WASTE CONTROL PLAN

Drill Site Coordinate Location: Z-9 Crib CCl_4 Vapor Extraction System Site, 200 West Area

Waste Container Storage Area(s) Coordinate Location(s): H135350, E566550 (200-ZP-2 Centralized Waste Container Storage Area)

Requirements for Soil Pile Sampling (if any): N/A

Nonregulated Material Disposal Location(s): Nonregulated materials will be dispositioned to the Hanford Site Central Landfill

SKETCH OF WORK SITE

Refer to 200-ZP-2 Test Plan, BHI-00182 (Figure 3)

APPROVALS (Print/Sign Name and Date)

D.A. Faulk 3-6-95
Lead Regulatory Agency Representative

B.L. Foley
DOE-RL

J.G. Zoghbi
Project/RI Coordinator

ATTACHMENT 1

WASTE CONTROL PLAN - PURUS RESIN BEAD VAPOR-PHASE SEPARATION TECHNOLOGY DEMONSTRATION

BACKGROUND

Currently, a vapor extraction system (VES) is operating at the 216-Z-9 Trench site which is located within the 200-ZP-2 Operable Unit (OU). Granular Activated Carbon (GAC) vessels are attached to the VES to extract volatile organic compounds, specifically carbon tetrachloride, from the vapor stream. A Purus resin bead vapor-phase separation system will be temporarily (about 3 months) installed and operated at the 216-Z-9 Trench site to replace part of the GAC vessels. After completion of the Purus system technology demonstration, an evaluation will be performed to compare the VOC separation efficiency, reliability, and cost effectiveness of the Purus system against the GAC treatment system.

An approved Waste Control Plan (WCP) currently exists for the 200-ZP-2 OU (and 216-Z-9 Trench site). This supplement to the 200-ZP-2 OU Waste Control Plan is to support the Purus system technology demonstration at the 216-Z-9 Trench Vapor Extraction Site. The vapor-extracted-condensate collected by the water knock-out tanks at the 200-ZP-2 OU is transferred to the 200-ZP-1 OU for treatment/disposal per an approved National Priorities List (NPL) Agreement/Change Control Form maintained at the 200-ZP-1 OU.

An evaluation of the Purus system operation indicates that potential constituents of concern are the same as those currently encountered at the 200-ZP-2 Operable Unit. That is, no new contaminants are anticipated as a result of the Purus system operation. As discussed below, the concentrated organic-phase and aqueous-phase liquid produced by the Purus system will be dispositioned separately from the GAC currently used at the 200-ZP-2 OU.

WASTE STREAMS

Contaminants generated from the Purus technology demonstration, the 200-ZP-1 OU, and the 200-ZP-2 OU are the same; primarily carbon tetrachloride and trace amounts of other VOCs. The potential contaminates of concern are addressed in the Purus Sampling and Analysis Plan (BHI-00182, Appendix A). Following are descriptions of anticipated Purus system waste streams:

1. Aqueous-Phase Liquid Waste. The volume is anticipated to be between 600 and 1,500 liters. This material may be treated with other 200-ZP-2 condensates under the 200-ZP-2 NPL Change Form at 200-ZP-1. If the liquid condensate is not processed through the 200-ZP-1 GACs, it will either be dispositioned off-site for disposal as hazardous waste or remain in storage at the 200-ZP-1/ZP-2 Centralized Waste Container Storage Area

with CERCLA waste pending future dispositioning. There is a possibility that hydrochloric acid may be generated as a carbon tetrachloride degradation product; this will be monitored and controlled through neutralization (e.g., limestone scrubber), as needed.

2. Organic-Phase (Carbon Tetrachloride) Liquid Waste. The volume is anticipated to be between 600 and 1,500 liters. The estimated three to eight drums (55-gallon size) will be dispositioned off-site as hazardous waste.

3. Granular Activated Carbon. The GAC column (two 2000 lb. drums) used for polishing the Purus system effluent vapor stream will eventually be recycled with other GAC from 200-ZP-2. The 400 lb. GAC drum used for pressure relief of the Purus system condensate tank will also be recycled with other GAC from 200-ZP-2. If an evaluation of the effluent-vapor-stream analyses indicate that the GAC is not saturated with VOCs, the GAC may be reused prior to recycling.

4. Polymeric Resin Beads. The Purus process and design provides for on-site thermal regeneration of both treatment cells. Dependent upon success of the regeneration/decontamination efforts, the beads will either be dispositioned off-site for reuse (returned to Purus), disposed off-site as a hazardous waste, or stored with other 200-ZP-2 CERCLA waste for future dispositioning.

5. Decontamination Materials.

   A. Flushing water will be managed as detailed in Item #1 above.

   B. Approximately 40 liters of isopropanol-water mixture will be used for decontamination. This will be combined with liquid CCl_4 (Item #2 above) and dispositioned off-site as hazardous waste.

   C. Soapy water volumes will be minimized. The soap utilized will be nonhazardous. Soapy decontamination water will be incorporated with other fluids (Item #2 above) for off-site disposal as hazardous waste.

   D. Solid decontamination waste, such as wipe rags and some personal protective equipment (gloves), will be accumulated with 200-ZP-2 solid contaminated waste.

WASTE MINIMIZATION

Following are potential or planned activities to reduce volumes and/or toxicity of waste streams generated during the Purus technology demonstration.

1. Aqueous-Phase Liquid Waste Treatment. An estimated six hundred to fifteen hundred liters (about three to eight 55-gal drums) of waste water may be generated during the Purus technology demonstration. This aqueous phase liquid will be sampled and analyzed as discussed in the Appendix A of the Purus Test Plan (BHI-00182). An engineering evaluation will be performed to determine the feasibility of treating the aqueous phase on-site (e.g., 200-ZP-1 OU pump and treat) based on the analytical results. Other factors to be considered in the evaluation include the effectiveness of separating the organic and aqueous phases and cost effectiveness.

2. Purus System Protection - pH control. Aqueous-phase liquid wastes will be analyzed for hydrochloric acid (pH and chloride ion) as discussed in the Purus test plan (BHI-00182). If needed, the HCl will be removed from the desorption vapor stream using a calcium carbonate (limestone) scrubber. The elimination of HCl in the effluent vapor stream will reduce internal corrosion of Purus system thus maximizing the life of the internal components (compressors, resin beds, piping, etc.).

3. Granular Activated Carbon. The GAC will be recycled by regeneration with other 200-ZP-1 GAC. However, the potential on-site reuse will be evaluated prior to recycling the GAC.

4. Purus Resin Beads. The Purus test plan (BHI-00182), process, and design, support on-site thermal regeneration of the resin beads within the adsorption/ desorption chambers of the Purus system. Dependent on the effectiveness of regeneration, final disposition of resin beads will be either off-site (returned to Purus) or on-site.

5. Decontamination solids, containers, and reusable personnel protective equipment (PPE). These materials will be decontaminated with soapy water and reused or disposed as non-hazardous waste.

RESPONSIBILITIES

1. The Purus system will operate under the direction of Environmental Remediation Contractor (ERC) Field Services. The following waste management controls will be performed:

   A. Draining the condensate collection tank, which will include separating the aqueous and organic phases

B. transport GAC for recycling

C. containerize resin beads for on- and/or off-site disposal, if necessary.

D. decontamination of miscellaneous equipment and reusable PPE

E. pH monitoring and control of aqueous phase waste

F. accumulate waste at 200-ZP-2

G. decontamination/decommissioning of Purus system according to ERC approved Purus procedure.

2. ERC personnel or 200 Area Projects will implement the Sampling and Analysis Plan requirements set forth in the Purus test plan (BHI-00182, Appendix A).

3. ERC Field Services will arrange for waste transfers to Westinghouse (WHC) and will ensure compliance with WHC-EP-0063-4, including the transfer of carbon tetrachloride concentrates for off-site treatment.

4. WHC personnel will receive waste for on- and/or off-site disposal. Analytical records will be provided to WHC to verify waste designations.

MANAGEMENT PROCESSES

The CERCLA waste will be managed in accordance with CERCLA requirements. BHI-FS-01, Section 4.1 will be used for shipping CCl_4. Non-hazardous waste will be managed according to BHI-FS-01, Section 4.5.

Control Number: BHI-00188	**200 NPL Agreement/Change Control Form** __ Change _X Agreement __ Information Operable Unit(s): 200-ZP-2	Date Submitted: March 1, 1995 Date Approved:

Document Number/Title: BHI-00182; Rev. 00 Vapor-Phase Resin Bead Separation Technology Demonstration Test Plan	Date Document Last Issued: February 1995
Originator: S. A. Driggers	Phone: 372-3493

Summary Discussion:
The referenced technology demonstration test plan was developed to support the Hanford field test activities of the Purus PADRE (a registered trademark of Purus) A3000 vapor-phase resin bead separation system. The Purus system is being considered by the Environmental Restoration Contractor as a possible replacement for granular activated carbon treatment currently used at the 200-ZP-2 Operable Unit Carbon Tetrachloride Expedited Response Action (ERA). The purpose of the field test is to demonstrate the performance, reliability, and cost-effectiveness of the Purus system in removing air-extracted volatile organic compounds from the 216-Z-9 Trench site vapor extraction system, the largest of three vapor extraction systems operating under the ERA. The technology demonstration field test is planned for a three month period beginning the first week of March 1995. At the conclusion of this field test, a technology evaluation report will be completed, to support a decision on whether the technology should be implemented to replace a portion of the granular activated carbon treatment systems (e.g. 216-Z-9 Trench site vapor extraction system).

Justification and Impact of Change:
Prior to initiating the Carbon Tetrachloride ERA in February 1992, an ERA Proposal (DOE-RL-91-32, Draft B) was prepared that contained an engineering evaluation/cost analysis (EE/CA) and an Environmental Assessment prepared under NEPA. (Continued on page 2)

J. G. Zoghbi 200 Areas Project Manager	Date 3/3/95
B. L. Foley DOE Project Manager	Date 3/6/95
T. A. Wooley Ecology Unit Manager	Date 3/6/95
D. A. Faulk Env. Protection Agency Unit Manager	Date 3-6-95

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3.

Total pages 2

BHI-DIS ca 3-7-95

Justification and Impact of Change (continued)

The EE/CA identified soil vapor extraction with carbon adsorption as the preferred technology for removing carbon tetrachloride and other volatile organic compounds (VOCs) from the vadose zone underlying the targeted contaminated sites. The use of this technology was emphasized for the Phase I operations, meant to be the beginning of production-scale removal of carbon tetrachloride. However, the EE/CA also recommended that a feasibility study be conducted during Phase I to evaluate alternative onsite treatments for the extracted VOCs. The possible use of an alternative treatment system was considered necessary for the current Phase II operations of the ERA, meant to be the long-term production mode removal of the carbon tetrachloride. in January 1995, the Evaluation of Carbon Tetrachloride Treatment Alternatives for The Expedited Response Action at the 200-ZP-2 Operable Unit (BHI-00272, Rev. 00) identified the Purus vapor-phase resin bead separation system as the most promising alternate technology for onsite treatment of the extracted VOCs as compared with the current granular activated carbon systems, thermal oxidation, catalytic oxidation, cryogenic condensation, and vapor-phase membrane separation.

A field test of the Purus system is desired to substantiate vendor claims regarding the system's efficiency, reliability, and operating costs. The Purus test system will temporarily replace one of the three granular activated carbon treatment trains currently in use at the 216-Z-9 Trench site. Parameters to be monitored throughout the test include separation efficiencies, power consumption, waste disposal costs, maintenance requirements, and dependability. These parameters and others, discussed in the test plan, will provide the information necessary to critically evaluate this system and support the final decision to apply or not apply this technology at the vapor extraction system.

Impacts to the current operations of the 216-Z-9 Trench will consist of brief periods of downtime associated with installation of the Purus system at the vapor extraction equipment (approximately one to two weeks). Other impacts to the ERA are the accumulation of carbon tetrachloride as a liquid hazardous waste stream and the possibility of managing the resin beads used in the Purus system as a hazardous waste stream at the conclusion of the test period. The 200-Zp-2 Operable Unit Waste Control Plan will be revised to include management of these waste streams in addition to the granular activated carbon waste.